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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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DAVID J COLE
E INK CORPORATION
733 CONCORD AVE
CAMBRIDGE, MA 02138-1002

EXAMINER

THOMPSON, TIMOTHY J

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 01/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/064,779

Applicant(s)

AMUNDSON ET AL.

Examiner

Timothy J Thompson

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-6, 26, 27 and 30-37 is/are allowed.
- 6) ☒ Claim(s) 7-12, 14-20, 23-25, 28 and 29 is/are rejected.
- 7) ☒ Claim(s) 13, 21 and 22 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 August 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 7-9 and 38 are rejected under 35 U.S.C. 102(e) as being anticipated by Whitehead et al.(U.S. Patent No. 6,384,979).

Regarding claim 7, Whitehead et al. discloses; a reflective sheet having a prismatic inward surface and an opposed outward surface(Fig 2B, 10); an electrophoretic medium contacting the prismatic surface(Fig 2B, 34A); a plurality of particles suspended in the electrophoretic medium(Fig 2B, P_m); and means for applying a voltage across the electrophoretic medium to selectively move the particles closely adjacent the prismatic surface to frustrate total internal reflection at the prismatic surface of light rays passing through the reflective sheet(col 10, line 56 through col 11, line 16), the electrophoretic medium having an index of refraction sufficiently smaller than the index of refraction of the reflective sheet that most of the light passing through the reflective sheet undergoes total internal reflection at the prismatic surface when the particles are not closely adjacent the prismatic surface(col 5, clos 35-42; col 8, lines 25-

30; col 11 lines 1-11)), wherein the electrophoretic medium and the plurality of particles are contained within a plurality of capsules(fig 2B, 34A, 34B, 34C, 34D).

Regarding claim 8, Whitehead et al. discloses; wherein the walls of the capsules have a refractive index which does not differ from the refractive index of the reflective sheet by more than about 0.3(since the capsule walls are formed by the prism this limitation is inherently meet).

Regarding claim 9, Whitehead et al. discloses; wherein the walls of the capsules have a refractive index which does not differ from the refractive index of the reflective sheet by more than about 0.2.(since the capsule walls are formed by the prism theis limitation is inherently meet).

Regarding claim 38, Whitehead et al. discloses; a reflective sheet having a prismatic inward surface and an opposed outward surface(Fib 2B, 10); an electrophoretic medium contacting the prismatic surface(Fig 2B, 34A); a plurality of particles suspended in the electrophoretic medium(Fig 2B, P_m); and means for applying a voltage across the electrophoretic medium to selectively move the particles closely adjacent the prismatic surface, wherein the particles comprise at least one light-scattering or light-absorptive center disposed within a light transmissive matrix, whereby, when the particles are disposed closely adjacent the prismatic surface, most of the light passing through the reflective sheet passes into the particles and is scattered or absorbed by the light-scattering or light-absorptive center. (col 10, line 56 through col 11, line 16),

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whitehead et al.(U.S. Patent No. 6,384,979) as detailed in claim rejection 7.

Regarding claims 10 and 11, Whitehead et al. as detailed in claim rejection 7 above does not disclose the walls of the capsules have a thickness not greater than about 200 nm or greater than even 100 meters although figure 2A discloses capsules with walls. It would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the walls of the capsules with a thickness of not greater than about 200 nm or greater than even 100 meters, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whitehead et al.(U.S. Patent No. 6,384,979) as detailed in claim rejection 7, and further in view of Webber(U.S. Patent No. 6,384,979).

Regarding claims 12 and 14, Whitehead et al. as detailed in claim rejection 7 above does not disclose the medium has a viscosity modifier of polyisobutylene. However, Webber discloses an electrophoretic medium with a viscosity modifier of polyisobutylene(para 11). It would have been obvious to one skilled in the art at the time of the invention to use polyisobutylene as a viscosity modifier as shown by Webber, in the electrophoretic medium of Whitehead et al., since as shown by Webber, polyisobutylene is commonly used as a viscosity modifier in electrophoretic medium so as to achieve to proper viscosity which will allow the electrophoretic particle to properly move with in the medium.

Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whitehead et al.(U.S. Patent No. 6,384,979) as detailed in claim rejection 7, and further in view of Webber(U.S. Patent Pub. No. 2002/0180687).

Regarding claims 15-17, Whitehead et al. discloses; a reflective sheet having a prismatic inward surface and an opposed outward surface(Fig 2B, 10); an electrophoretic medium contacting the prismatic surface(Fig 2B, 34A); a plurality of particles suspended in the electrophoretic medium(Fig 2B, P_m); and means for applying a voltage across the electrophoretic medium to selectively move the particles closely adjacent the prismatic surface to frustrate total internal reflection at the prismatic surface of light rays passing through the reflective sheet(col 10, line 56 through col 11, line 16), the electrophoretic medium having an index of refraction sufficiently smaller than the index of refraction of the reflective sheet that most of the light passing through

the reflective sheet undergoes total internal reflection at the prismatic surface when the particles are not closely adjacent the prismatic surface(col 5, clos 35-42; col 8, lines 25-30; col 11 lines 1-11)), wherein the electrophoretic medium and the plurality of particles are contained within a plurality of capsules(fig 2B, 34A, 34B, 34C, 34D). Whitehead et al. does not disclose the electrophoretic medium has a viscosity modifier of polyisobutylene, the mathematical limitations of claim 16 or the viscosity modifier gels the medium(claim 18). However, Webber discloses an electrophoretic medium with a viscosity modifier of polyisobutylene(para 11). It would have been obvious to one skilled in the art at the time of the invention to use polyisobutylene as a viscosity modifier as shown by Webber, in the electrophoretic medium of Whitehead et al., since as shown by Webber, polyisobutylene is commonly used as a viscosity modify in electrophoretic medium so as to achieve to proper viscosity which will allow the electrophoretic particle to properly move with in the medium. Regarding the mathematical limitations of claim 16 or the gelling of the medium of claim 18, a modified Whitehead obviously meets these limitations since polyisobutylene is used as the modifier, which is the same modifier as the applicant's.

Claims 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whitehead et al.(U.S. Patent No. 6,384,979) in view of Jacobson et al.(U.S. Patent No. 6,241,921).

Regarding claim 19, Whitehead et al. discloses; a reflective sheet having a prismatic inward surface and an opposed outward surface(Fib 2B, 10); an

electrophoretic medium contacting the prismatic surface(Fig 2B, 34A); a plurality of particles suspended in the electrophoretic medium(Fig 2B, P_m); and means for applying a voltage across the electrophoretic medium to selectively move the particles closely adjacent the prismatic surface to frustrate total internal reflection at the prismatic surface of light rays passing through the reflective sheet(col 10, line 56 through col 11, line 16), the electrophoretic medium having an index of refraction sufficiently smaller than the index of refraction of the reflective sheet that most of the light passing through the reflective sheet undergoes total internal reflection at the prismatic surface when the particles are not closely adjacent the prismatic surface(col 5, clos 35-42; col 8, lines 25-30; col 11 lines 1-11)), wherein the electrophoretic medium and the plurality of particles are contained within a plurality of capsules(fig 2B, 34A, 34B, 34C, 34D). Whitehead et al. does not disclose wherein the particles comprise a pigment bearing a polymer coating. However, Jacobson et al. discloses a pigment bearing a polymer coating so as to confer a desired charge(col 2, lines 1-15). It would have been obvious to one skilled in the art at the time of the invention to use particles having a pigment bearing a polymer coating as shown by Jacobson et al., in the electrophoretic medium of Whitehead et al., since as shown by Jacobson et al., particles having a pigment bearing a polymer coating are commonly used so as to confer a desired charge.

Claims 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Whitehead et al.(U.S. Patent No. 6,384,979) and further in view of Jacobson et al.(U.S.

Patent No. 6,241,921) as detailed in claim rejection 19 above, and further in view of Honeyman et al. (U.S. Patent Pub. No. 2002/0185378).

Regarding claim 20, a modified Whitehead et al. in view of Jacobson et al., discloses the polymer can be any inorganic or organic pigment commonly used (Jacobson col 2, lines 18-35) and Honeyman et al. discloses that electrophoretic displays commonly use carbon black (para 22), therefore a modified Whitehead discloses using carbon black.

Claims 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Whitehead et al. (U.S. Patent No. 6,384,979) and further in view of Jacobson et al. (U.S. Patent No. 6,241,921) as detailed in claim rejection 19 above, and further in view of Brown et al. (U.S. Patent No. 6,156,389).

Regarding claim 23, a modified Whitehead et al. in view of Jacobson et al., does not disclose the polymer coating having at least one fluorinated monomer. However, Brown et al. discloses polymer coating having at least one fluorinated monomer (col 3, lines 1-25). It would have been obvious to one skilled in the art at the time of the invention to use a polymer coating having at least one fluorinated monomer as shown by Brown et al., in the electrophoretic medium of a modified Whitehead et al., since as shown by Brown et al., a polymer coating having at least one fluorinated monomer are commonly used so as to so as to form a hydrophobic coating.

Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whitehead et al.(U.S. Patent No. 6,384,979) in view of Harbour et al.(U.S. Patent No. 4,272,596).

Regarding claims 24, 25, Whitehead et al. discloses; a reflective sheet having a prismatic inward surface and an opposed outward surface(Fig 2B, 10); an electrophoretic medium contacting the prismatic surface(Fig 2B, 34A); a plurality of particles suspended in the electrophoretic medium(Fig 2B, P_m); and means for applying a voltage across the electrophoretic medium to selectively move the particles closely adjacent the prismatic surface to frustrate total internal reflection at the prismatic surface of light rays passing through the reflective sheet(col 10, line 56 through col 11, line 16), the electrophoretic medium having an index of refraction sufficiently smaller than the index of refraction of the reflective sheet that most of the light passing through the reflective sheet undergoes total internal reflection at the prismatic surface when the particles are not closely adjacent the prismatic surface(col 5, clos 35-42; col 8, lines 25-30; col 11 lines 1-11)), wherein the electrophoretic medium and the plurality of particles are contained within a plurality of capsules(fig 2B, 34A, 34B, 34C, 34D). Whitehead et al. does not disclose wherein the volume fraction of the particles in the electrophoretic medium is at least about 50 per cent or greater than 70 percent, infact he does not disclose the exact percentage of particles to medium. However, Harbour et al.discloses the volume fraction of the particles in the electrophoretic medium is at least about 50 per cent or greater than 70 percent, infact he does not disclose the exact percentage of particles to medium (col 2, lines 15-35). It would have been obvious to one skilled in the

art at the time of the invention to use a volume fraction of the particles in the electrophoretic medium is at least about 50 per cent or greater than 70 percent as shown by Harbour et al., in the electrophoretic medium of Whitehead et al., since as shown by Harbour et al., the volume fraction of the particles in the electrophoretic medium is at least about 50 per cent or greater than 70 percent is commonly used so as to have the proper percentage of particles to medium to produce the desired color.

Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whitehead et al.(U.S. Patent No. 6,384,979) in view of Herb et al.(U.S. Patent Pub. No. 2003/0132908).

Regarding claims 28, 29, Whitehead et al. discloses; a reflective sheet having a prismatic inward surface and an opposed outward surface(Fig 2B, 10); an electrophoretic medium contacting the prismatic surface(Fig 2B, 34A); a plurality of particles suspended in the electrophoretic medium(Fig 2B, P_m); and means for applying a voltage across the electrophoretic medium to selectively move the particles closely adjacent the prismatic surface to frustrate total internal reflection at the prismatic surface of light rays passing through the reflective sheet(col 10, line 56 through col 11, line 16), the electrophoretic medium having an index of refraction sufficiently smaller than the index of refraction of the reflective sheet that most of the light passing through the reflective sheet undergoes total internal reflection at the prismatic surface when the particles are not closely adjacent the prismatic surface(col 5, clos 35-42; col 8, lines 25-30; col 11 lines 1-11)), wherein the electrophoretic medium and the plurality of particles

are contained within a plurality of capsules(fig 2B, 34A, 34B, 34C, 34D). Whitehead et al. does not disclose wherein the plurality of particles vary in electrophoretic mobility, at least one of the particles having an electrophoretic mobility which is at least twice that of another of the particles. However, Herb et al. discloses wherein the plurality of particles vary in electrophoretic mobility, at least one of the particles having an electrophoretic mobility which is at least twice that of another of the particles or even five times that of the other particle (figures 3-5, note as the voltage increases the mobility will eventually become five times greater). It would have been obvious to one skilled in the art at the time of the invention to at least one of the particles having an electrophoretic mobility which is at least twice that of another of the particles or even five times that of the other particle as shown by Harbour et al., in the electrophoretic medium of Whitehead et al., since as shown by Harbour et al., at least one of the particles having an electrophoretic mobility which is at least twice that of another of the particles or even five times that of the other particle is commonly used so as to allow for a multicolored pixel.

Allowable Subject Matter

Claims 13, 21, 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. With the allowable features being; the conditional formula pertaining to the electrophoretic medium(claim 13); the conditional formula pertaining to the percentage of carbon with the polymer as well as the type of attachment of the polymer to the carbon black(claim 21); the composition of the polymer coating(claim 22).

Claims 1-6, 26, 27, 30-37 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art taken either singularity or in combination fails to anticipate or fairly suggest the limitations of the independent claim, in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claim 1, 26, 30, 32, 34, 35, with the allowable features being; the reflective sheet having a prismatic inward surface and an opposed outward surface with the gap between the first and second electrodes is of a constant width(claim 1); at least some of the plurality of particles are attached to the reflective sheet by flexible filaments(claim 26); the conditional formula pertaining to aspect ratio of the flat plates and prism(claim 30); the electrode having an insulating layer with a low refractive index(claim 32); a plurality of cross walls extending from the reflective sheet to the rear support(claim 34); the electropertic medium having first and second phase plates(claim 35); . Therefore claims 1-6, 26, 27, 30-37 are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy J. Thompson whose telephone number is (703) 305-0881. If the examiner can not be reached his supervisor, Georgia Epps, can be reached on (703) 308-4883.

T.J.T.
1/16/04

Handwritten signature of Timothy J. Thompson, consisting of a stylized 'TJ' followed by a cursive 'Thompson'.